



CHICAGO JOURNALS



History
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Science
Society

The Zoological Section of the Nuzhatu-l-Qulûb

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Source: *Isis*, Vol. 11, No. 2 (Dec., 1928), pp. 285-315

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The Zoological Section of the Nuzhatu-l-Qulûb.

(a Persian Compendium of Science, 1340 A. D.)

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INTRODUCTION.

I have been for some time past engaged in preparing an edition, with a translation and notes, of the text of the Zoological part of the *Nuzhatu-l-Qulûb* of ḤAMDULLÂH MUSTAUFÎ QAZWÎNÎ, a Persian Encyclopaedia of science, completed in A. D. 1339-40. This will shortly be published by the Royal Asiatic Society. In

the meantime, it may perhaps be permitted me to give some account of the work, and to explain the place of the *Nuzhat* in the history of Zoology.

In the case of most of the animals described, the medical uses of their several parts or organs are also given; and we are thus put in possession of a list of drugs of animal origin employed at this particular period, and of the diseases in which they were used; the fifth section of the present essay thus deals with medical practice in 14th century Persia.

I. THE AUTHOR.

The author of the present work, ḤAMDULLÂH B. ABÎ BAKR B. ḤAMD AL-MUSTAUFÎ AL-QAZWÎNÎ, was born about A. H. 680 (A.D. 1281-2). He professed to be of Arab origin, but his family had long been settled in Qazwîn. About 1311 he was appointed by the physician and historian RASHÎDU-D-DÎN, the wazîr of ABÛ SA'îd the Mongol Îl-Khân, to be superintendent of the finances of Qazwîn, Abhar, Zanjân and Târumain. In the preface to the *Nuzhatu-l-Qulûb* he tells us that, following in the footsteps of his forefathers, he had devoted himself from his youth upwards to financial business, and had visited in the discharge of his duties Sulṭâniyyah, Tabrîz, Baghdâd, Iṣfahân, and other Muslim cities, neglecting no opportunities of adding to his store of knowledge by the reading of books and the conversation of the learned.

The first of his works to be published was the *Târikh-i-Guzîda* ('Select History'), a universal history, compiled from sources which he mentions, and completed A. H. 730 (A. D. 1330). This has been published by the Gibb Trustees in the form of a photographic reproduction of one of the MSS. It is described by BROWNE as being inferior to certain other histories of the early Mongols; it is however « a useful compendium of Persian and Muhammadan history, and contains a good deal of interesting matter, collected by the author from some two dozen earlier works in Arabic and Persian. »

The second of his works is the *Zafarnâma* ('Book of Victory'), a vast rhymed chronicle of Persian history, continuing FIRDAUSÎ's great epic. This was begun when he was about forty, and occupied him fifteen years, but it was put aside when two-thirds completed in order to produce the *Târikh-i-Guzîda*, and was finished five

years after that work, in A.H. 735. The *Nuzhatu-l-Qulûb* ('Hearts' Delight'), the third of his works, was completed in A.H. 740 (A.D. 1339-40).

There seems to be no record of the date of his death.

II. THE NUZHATU-L-QULÛB.

MUSTAUFÎ states in his preface to the *Nuzhatu-l-Qulûb* (I quote from RIEU's catalogue) that having obtained and perused the following four Arabic works, — *Şuvaru-l-Aqâlim* by ABÛ ZIÂD AḤMAD B. SAHL AL BALKHÎ, *al-Tibyân* by AḤMAD B. ABÎ 'ABDILLÂH (which RIEU thinks may be the *Kitâbu-l-Buldân* of AḤMAD B. 'ABDILLÂH MUḤAMMAD AL-BARQÎ), *Masâliku-l-Mamâlik* by ABÛ-L-QÂSIM 'UBAIDULLÂH B. KHORDÂD KHURÂSÂNÎ, and *Jahân-Nâma*, the author of which is not named, — he made from them the present compilation, and enlarged it with additional matter derived from his personal knowledge and from a number of other works, of which he gives a list.

The *Nuzhatu-l-Qulûb* may be described as a kind of scientific encyclopaedia, or perhaps better as a scientific popular educator; it gives a conspectus of scientific knowledge, from astronomy to psychology and ethics. Its style, in general, is short, terse and homely, often of an almost notebooklike brevity, the very reverse of the high-flown artificial 'literary' idiom. An introductory section deals with the spheres, heavenly bodies, and elements, and then considers the 'inhabited quarter' of the earth, longitude and latitude, and the climates. The body of the work is divided into three maqâlas, the first treating of the mineral, vegetable, and animal kingdoms; the second of man, his bodily structure (anatomy), faculties and moral qualities; and the third of geography. An epilogue is devoted to wonders and curiosities, — those of Îrân and of the rest of the world.

The Bombay lithograph of the *Nuzhat* contains 372 pages, of which the section now under consideration occupies 38. The zoological portion of the work, that which is here discussed, is the third martaba of the First Maqâla. G. LE STRANGE has previously published the text and translation of the Third Maqâla (the geographical portion) and the Epilogue. The rest of the work has not yet been critically edited or translated.

III. THE ZOOLOGICAL PART OF THE NUZHAT.

The zoological part of the *Nuzhatu-l-Qulûb*, comprising 38 pp. of the Bombay lithograph, succeeds the mineralogical (16½ pp.) and botanical (36 pp.) portions.

Animals are classified as

- (1) Of the Land; and these again as
 - (a) Domestic
 - (b) Wild Animals
 - (c) Beasts of Prey
 - (d) Poisonous Animals and Creeping Things
 - (e) Animals certain of whose Members resemble Man
- (2) Of the Sea
- (3) Of the Air.

A separate paragraph is devoted to each animal, the paragraphs being arranged, in each of the several sections, in the alphabetical order of the Arabic names of the animals. In the case of the larger and better known animals the Arabic is followed by the Persian name; sometimes another Arabic name is given, and often also the Turkish and Mongolian equivalents; since Persia, at an earlier period under the rule of the Seljûq Turks, had when the *Nuzhat* was written passed under the domination of the Mongols. It is then stated whether the animal is allowed to be eaten; and the qualities of its flesh — hot or cold, dry or moist — are sometimes given. A short description of the animal follows, usually limited to a few selected features; and lastly there is given a list of the medical uses of the various parts or organs. Sometimes this medical part forms the larger portion of the account of the animal; occasionally the magical uses of certain organs are also given. The accounts of the smaller and less familiar animals are much shorter, sometimes hardly more than the name.

The total number of animals described is 228. The first division of Terrestrial Animals, the Domestic, contains 10 names, — Camel, Mule, Ox, Buffalo, Ass, Cat, Sheep, Horse, Goat, Malaṭ, the last a purely mythical beast. The second division, Wild Animals, with 40 names, is a very heterogeneous assemblage, consisting of the Jackal, Weasel, Hare, Ibex, Fox, Pig, Lizard, Elephant, etc., etc. The third division, Noxious Beasts of Prey, numbers 20 members, — the Lion, Tiger, Bear, Wolf, Hyena, Cheeta, Dog, Mad Dog, Leopard, etc. The fourth division, numbering

39, is also very heterogeneous; here come the Viper, Flea, Dragon, Serpent, Earthworms, Beetles, Silkworm, Weevil, Scorpion, Bugs, Spider, Ant, etc. The fifth division consists of 11 entirely mythical animals, such as the Asbsâr, with head like a horse and body like a man, and in addition with two wings. Aquatic Animals number only 25, but the Fish, of which 37 kinds are given, counts as only one; among the others are the Crocodile, Crab, Turtle, Frog, Leech, etc. The Animals of the Air, 83 in number, are mostly Birds, but some Insects are also included.

A few examples will illustrate the method of treatment and the general style of the work.

(I) THE CAT :—*Sinnaur*, *Gurba* (Pers.), is called *Hirr* by some of the Arabs, *ġatak* by the Turks, *Malghûn* by the Mongols. It is a greedy animal, of various colours, and to eat it is unlawful, and to kill it forbidden. When angry, it becomes so enraged as to be beside itself; hence infidels used to bring up a devotee on the flesh of cats, so that he might overcome his antagonist. The cat is the enemy of the rat; and the elephant dreads the cat. In the *Mujmalu-t-Tawârîkh* it is said that the cat does not breed in China.

Those who apply its bile to their eyes become keen-sighted in the night; and half a drachm of it mixed with olive oil is beneficial to one with facial paralysis; and pounded up with cumin seed and salt it heals old wounds. The spleen of a black cat tied on a woman with excessive menstruation will check the flow, and until it is taken off the menses will not reappear. Its flesh boiled and used as a poultice to the gout allays the pain; and if eaten, magic will take no effect against the eater. If its blood is applied to tubercular leprosy, it will disappear. Its flesh, dried and rubbed up, and placed over the wound where a thorn or arrow-head has entered, will extract (the foreign body).

(II) THE APE :—*Qird*, *Kabî* (Pers.), called also *Buzîna* by the Persians, and *Bîhan* by the Turks. It is a quick-witted animal, with pretty tricks, droll, capable of being taught many things, and with many human traits. *Its Properties* : Its eye carried about one brings sleeplessness; rubbed up and applied to the eye it cures corneal opacities and gives greater clearness of vision. Eating its flesh cures tubercular leprosy; and anyone who eats its blood becomes tongue-tied, and appears ugly in men's eyes. Its skin is made into sieves; all seed that is sown after being sifted through it is safe against pests.

(III) THE LION :—*Asad*, *Sher* (Pers.), is called by the Arabs *Zarghâm*, *Ghazanfar*, *Qaswarat*, *Laith*, and *Hizabr*, and by the Turks *Arslân*; and the Arabs call its whelp *Shibl*. He is the most powerful and terrible

and majestic of the beasts of prey; it is true the majesty of the tiger surpasses that of the lion, but some have asserted that the tiger is itself a species of lion. When the lion kills his prey he eats its heart, and some of its other parts, and leaves the rest, and does not return to his half-eaten meal; he does no injury to a menstruous woman; and any animal that approaches him with submission he neither pursues nor injures; he is jealous of the female. And these qualities are those of kings; therefore he is called the king of beasts. In spite of his majesty, he is continually attacked by fever; from other diseases he is freed by eating an ape. The lion dreads a white cock, and a peacock, and fire; he is an enemy of the elephant. From fear of ants he betakes himself to salt-pans, since if an ant gets into his paw he cannot free himself from it, and perishes. In the *Mujmalu-t-Tawârikh* it is said that the lion does not propagate itself in Turkey.

Its Properties : Its brain allays tremors. Its bile makes a man brave and courageous, and cures epilepsy and ringworm of the scalp; applied to the eyes it cures them if bloodshot; as an ointment, it resolves tuberculous glands. Its fat is beneficial for piles, severe inflammations, and boils. If the fat of its eye along with oil of roses be rubbed on the face it will take on a formidable appearance; and it is useful in hemiplegia and paralysis. Its blood is beneficial in cancer. Sleeping on its skin takes away quartan fever, and piles; and when its skin is made into a drum, its sound will scatter the enemies' horses.

(IV) THE SCORPION :—‘*Agrab, Kazhdum* (Pers.), called by the Turks *jîyân*, is the most hideous and the most noxious of creeping things. It has eight legs, and its eyes are on its belly. Its young come forth from its back, and before coming forth eat the mother's internal organs. When it runs about, it stings with its tail whatever comes in contact with its head. If one is caught in a vessel and put into the oven till it is reduced to ashes, half a dâng of the ash taken internally will reduce the size of a stone in the bladder and then expel it; this ash too, mixed with oil, will cause the hair to fall out from any place where it is applied; and is also beneficial in long-standing fever and in palsies. The smoke from a scorpion will expel other scorpions from the house. Scorpions dried and rubbed up with vinegar, if applied on maculo-anaesthetic leprosy will effect a cure.

The ‘eyes’ on its belly are the eyelike openings of the book-lungs; the eyes are really on its head, but are inconspicuous.

(V) THE PARROT :—‘*Baigha, Tûtî* (Pers.), is mostly green. In the ‘*Âjâ’ibu-l-Makhlûqât* it says that there are yellow and red and white parrots. But its beak is always red; and its tongue is round, like a man's,

—hence it can pronounce words properly, and can be taught to talk. It never drinks water; if it does, it dies. It is forbidden to eat it. Eating its flesh brings eloquence, and increases the brightness of the eye, and gives strength of heart. Its bile taken internally makes the tongue heavy. If its blood be dried and rubbed up and scattered amongst a party of friends, they will fall out among themselves.

The above examples will be sufficient to show the general style of the work, and the general level of its contents. They may not induce the reader to rate the scientific acumen of the author very highly; yet scattered amongst much that is childish there are a number of happy descriptive touches. Of such the following are examples.

The giraffe is said to have « a neck like that of the camel, and a skin like that of the leopard, and four extremities like those of the cow; its forelegs are longer than its hindlegs, but in the books of the philosophers they say nothing as to the advantage of this. » The animal nature of the sponges is recognized; the sponge is « a marine organism, soft, with animal affinities. » The crab « has no head; its eyes are on its shoulders, and its mouth on its belly; it has eight legs, and goes sideways. » Sepia, the cuttlefish, « is of the shape of a Turcoman felt hat. When the fisherman tries to take it, so much ink comes out of its interior that the water around it becomes black; and whatever they dye with that water, the dye is permanent. »

There are however a number of very crude mistakes, which could not have withstood the test of even a cursory observation. Thus I cannot understand the statement that the elephant has no joints, except at the shoulder; « notwithstanding the bulk of its body, and that it has no joints except the shoulder, it moves actively. » There is a similar statement in the *Ĵamī'u-l-Ĥikāyât* (v. post.), and in DAMÎRÎ (the female elephant « never brings forth in any but a standing posture, there being no joints in her legs »). When I went on tour on an elephant in India, the animal knelt for me to mount; and its tail being held out like a skipping-rope, I stepped onto this and thence climbed up over its quarters to the howdah on its back; this I take to be the traditional mode, and anyone who had ever seen elephants mounted thus must have seen the legs bent under the animal, and appreciated the fact that the animal has joints.

Again, the crow is white at hatching, and becomes black at first moult.

« When the young one is hatched, its down is white ; its mother grieves, and abandons her young one ; but God (*may He be exalted !*) gathers together before it large numbers of flies and gnats, and it eats of them, till it moults the white down and produces black feathers ; then the mother draws near to the young one and takes it into her care again. »

The porcupine shoots out its quills.

« When an enemy comes on it, it shoots off some of the spines on its back at him, like arrows, and so keeps him off. »

The hyena is hermaphrodite ; « it has both male and female organs, in the manner of an hermaphrodite, and every year the organs of one sex are excited. » The hare is « one year a female and one year a male, and the female menstruates in the manner of women. »

Finally a few examples may be given of the numerous mythical animals described, sometimes with many particulars, by our author.

Thsu the Shâdawâr.

« is a fierce carnivore. In the '*Ajâ'ibu-l-Makhlûqât* it says that it has two horns, each with twenty-one branches, all of which are hollow inside, and provided with a hole ; when the wind blows on it it gives forth a sweet sound, and beasts and birds gather round and listen to the sound ; and as it finds opportunity it seizes on one of them as a victim and devours it. And men take its horns as a present for kings, and they set them up where the wind blows, so that they may give out those sounds ; and sometimes the sound it makes is so plaintive that it excites a sentiment of pity. »

As to the 'Arba : —

« In the '*Jâmi'u-l-Hikâyât* it says that in the country of Nubia there is a kind of animal with a countenance like a man's, which has two wings and a long tail, and in the hot season uses the tail as an umbrella, like the peacock ; and they associate with men and dance with them. »

Mermaids, or at any rate mermen, are recognized : —

« The water-man resembles the man of the land in everything, except

that he has a tail, and is smaller in body. When they appear in the sea the mariners rejoice, knowing that their appearance is the cause of calm waters. »

The Phoenix (Qaqnus) is said to be well known.

« It lives in India; it has a long beak, with many holes in it, and from every one there proceeds a different note. When it sings, no animal can pass by because of the sweetness of its song. And it does not beget young; at the time of death male and female collect a large quantity of firewood, and interlink their beaks together and flap their wings; from the clash of their wings the wood catches fire, and blazes, and the two phoenixes are consumed; rain falls on their ashes, and a worm appears therein, and eats of the ashes, and grows to a large size and becomes another phoenix. *And praise be to Him ! how great is His glory in the creation of the animals !* They say that they invented the organ in imitation of the song of this bird. »

IV. THE PLACE OF THE NUZHAT IN THE HISTORY OF ZOOLOGY.

1. — *Previous Works on Zoology.*

Arabic works on Natural History are few, and Persian works are non-existent, before the time of MUSTAUFÎ. There seems indeed to be no systematic zoological treatise before the *Nuzhat* except that of JÂHIZ (d. 255/869), called *Kitâb al-Hayâwân* (« Book of Beasts »), which however (like that of AD-DAMÎRÎ later) is for the most part of philological and literary interest « giving more the grammatical structure and meanings of the names of animals than their descriptions » (JAYAKAR). It contains, as CARRA DE VAUX informs us, anecdotes, reflections and literary recollections suggested by the animals treated of, and also many chapters which have no concern with animals.

There were however also in existence a number of special treatises; the origin of one group of these is explained by GEYER (*Sitzungsber. Wien. Akad. Wiss., Phil.-Hist. Classe*, vol. 115, 1887). The animals of the desert play a great part in ancient Arabic poetry, and many names and « epitheta ornantia » were given to them; these were zealously gathered together by the philologists, whose activity resulted in the production of works with the title *Kitâb al-Wuhûsh* (« Book of Beasts ») or *K. Asmâ al-wuhûsh* (« Book of the Names of Beasts »). GEYER gives a list of eleven

such authors, but the book of AL-AŞMÂ'Î (b. 739, d. 831 A.D.) is, according to GEYER, the only one which is known to exist in Europe. The work is not a long one; it is reproduced by GEYER, and occupies 440 lines, about 22 pages of the journal. The animals treated of are the ass, ox, antelope, mountain goat, ostrich, lion, wolf, hyena, fox, and hare; verses are given from the poets illustrating the use of the names adduced.

Another group of treatises consists of works devoted to a special animal, — in particular to the horse. AL-AŞMÂ'Î here again furnishes us with an example; his *Kitâb al-Khail* has been edited and annotated by HAFNER (*Sitzungsber. Wien. Akad. Wiss., Phil.-Hist. Classe*, vol. 132, 1895); it occupies 468 lines, or 24 printed pages. The names given to the horse are recounted, here again with examples of their use from the poets, and this is followed by a description of their desirable and undesirable qualities, their colours, etc. According to JAYAKAR, ABÛ 'UBAIDA (b. 728, d. 825 A.D.) claimed to have composed a work in fifty volumes on the horse. AL-AŞMÂ'Î wrote, besides his work on the horse, treatises on the camel and on the sheep.

2. — *Zoological Sources of the Nuzhat.*

MUSTAUFÎ does not pretend to be more than a compiler; but in view of the scarcity of zoological works existing in his day it is obvious that the greater part of his information cannot have come from them, but must have been derived from elsewhere. He gives us in his preface a list of his authorities (v. antea, p. 287), which mostly can have little to do with Zoology, however useful they may have been for the other parts of the *Nuzhat*. More information can be got from his references to authorities in the zoological portion itself; these I have collected together, as follows :

By far the most frequently quoted work is the '*Ajâ'ibu-l-Makhlûqât*' of ZAKARÎYÂ B. MUHAMMAD B. MAHMÛD AL-QAZWÎNÎ, b. 1203, d. 1283 A.D., which is referred to 31 times. Next in frequency comes the '*Jâmi'u-l-Hikâyât*' of MUHAMMAD 'AUFÎ (completed in A.D. 1232-3), quoted 13 times; no other authority is quoted more than three times. The '*Mujmalu-t-Tawârikh*' (a work which I have been unable to trace), the '*Qişaşu-l-Anbiyâ*' (probably *ath-Tha'labî's*), and the '*Târikh-i-Maghrib*' of NAŞÎRU-D-DÎN TÛSÎ, are quoted three times. The '*Maşâbîh*', a book of

traditions by AL-BAGHAWÎ, and the *Šuwaru-l-Aqâlim*, by AL-BALKHÎ, twice. The *Târikh-i-Banâkatî* (or *Fanâkatî*) of ABÛ SULAIMÂN DÂ'ÛD of Banâkat (the modern Tâshkand), the *Tanšikh-Nâma* (probably the *Tansûq-Nâma* of NAŞÎRU-D-DÎN TÛSÎ), the *Šihâh* of JAUHARÎ, the works (*Taşânîf*) of ABÛ RAIHÂN (or AL-BÎRÛNÎ), the *Minhâj* (probably the *Minhâju-t-Tâlibîn*, a manual of jurisprudence by AN-NAWAWÎ), the *Masâliku-l-Mamâlik* of ABÛ-L-QÂSIM 'UBAIDULLÂH B. KHORDÂD KHURÂSÂNÎ, the *Sîratu-n-Nabî* (presumably, according to BROWNE, the *Life of MUHAMMAD* by B. HISHÂM), the *Kalîla* (i.e., the *Kalîla wa Dimna* of NAŞRULLÂH B. 'ABDU-L-ĤAMÎD), the *Tafsîr-i-Kulînî* (or *Kalbî*) (which I have not traced), the *Rab'î-u-l-Abrâr* of ZAMAKHSHARÎ, the *Târikh-i-Jarîr* (probably the great history of MUHAMMAD JARÎR AṬ-ṬABARÎ), and the *Shaikh-u-r-Rîs* (whom I have not traced), once each.

The above works are directly quoted in the zoological part itself as authorities for certain statements; and since the '*Ajâ'ibu-l-Makhlûqât*' and the *Jâmi'u-l-Hikâyât* are referred to with some frequency, we may consider a little further MUSTAUFÎ's indebtedness to these.

3. — *The 'Ajâ'ibu-l-Makhlûqât.*

The '*Ajâ'ibu-l-Makhlûqât*', a cosmography by ZAKARÎYÂ B. MUHAMMAD B. MAĤMÛD AL-KAMMÛNÎ AL-QAZWÎNÎ, was written in Arabic in 1263 A.D., and a second enlarged edition was put forth in 1275. It was later translated into Persian. The Arabic text has been edited by WUSTENFELD, and a portion (going as far as metals, but stopping short of vegetables, animals, and man) has been translated by ETHÉ.

I have examined the MS. (Add. 16739) of the Persian translation in the British Museum Library. The zoological part takes up 57 folios or 114 pages; it follows the sections on Man and the Jinn, and describes 130 animals under the heads of (I) Beasts of Burden, (II) Cattle, (III) Beasts of Prey, (IV) Flying Animals, (V) Reptiles and Insects, as well as, shortly, some animals of strange shape, and some compound animals, made up of two of different kinds.

As an illustration of the style and matter of the work, the following examples will serve : —

(I) '*Aqrab*, the Scorpion, called *Kazhdum* in Persian, is the most noxious of reptiles, and when it has struck anyone, it immediately makes off. It has eight legs, and its eyes are on its belly. It comes out of its hole in the first part of the night, (when) it is lively, and strikes everything it sees. Whenever it sees a snake, it strikes it; if the snake can seize it, it eats it and is safe, but if the scorpion gets away, the snake dies. And a physician heard a man say to another. 'Thou art like a scorpion, — thou injurest, and benefitest not'; he answered, 'I lay no such false charge against thee.' It benefits in many ways; if its belly be rubbed up and laid on the place it has stung, the pain will subside immediately; and if a scorpion be placed in a jar and its top closed, and placed in a hollow oven till the scorpion within the jar is reduced to ashes, and one *dânaq* of that be given to one with stone in the bladder, the stone will be broken up. And if a scorpion strikes anyone with an old-standing fever, the fever will be cured; and if it strikes one with hemiplegia, the palsy will pass off. And if a scorpion be burnt inside a house, no scorpion will remain therein; and if a large black scorpion be taken and dried and rubbed up, and anointed with vinegar on (maculo-anaesthetic) leprosy, the leprosy will be cured. And if a woman who is used to bring forth many children carries about with her a scorpion in a piece of cloth, she will have no more children thereafter. And if its ashes be mixed with oil and used as an ointment, they will cause the hair to grow.

The above may be compared with the corresponding extract given above from the *Nuzhat*.

(II) *Waṭwât*, the Mountain Swallow (? Swift), called *Bâlwâya* in Persian, is a well known bird. BALNYÂS (? = PLINIUS) says that if the *waṭwât* drowns in water, everyone who drinks of that water will sleep for a month; and if a man's hair be tied round the neck of a *waṭwât*, which is then set free, the man will never sleep till the bird dies (or) till the hair is taken from its neck. *On the Properties of its Parts* :— If its head be placed in the stuffing of a pillow, whoso lays his head on that pillow will sleep. If its brain be applied to the eye along with honey, it will be beneficial in cataract; and if it be cooked with oil of roses and used as an ointment for sciatica, it will be useful

(III) *Baghl*, the Mule, is born of the horse and the ass. If the stallion is the horse, the mule is more like the ass; and if the stallion is the ass, the mule is more like the horse. One of the wonders is that in every part the mule is intermediate between horse and ass, even to its voice, gait, etc., — all intermediate between horse and ass. They say the mule lives to a great age, because it rarely covers the female, and

she does not produce young; some say that the young do not become enclosed in her belly, and some that the passage is narrow and the young cannot pass out by it, — (if they do) the mother dies. *On the Properties of its various Parts* : — If its earwax be added to a woman's food, she will not become pregnant. If its brain be added to anyone's food, his senses fade away and he becomes as if asleep. If a woman eats its heart she will never become pregnant. If its hoof be burnt, and a woman eats the ashes, she will never conceive. If the ashes be mixed with oil of myrtle, and a bald head be anointed with it, it will cause hair to grow. If its testicle be dried and wrapped in a silken cloth and bound on a beast of burden, it will not tire in travelling. If a pregnant woman tastes its urine she will bring forth a dead child. If one smells a heap of mule's dung (when suffering from a cold), and spits on it, and then casts it into the road, whoever puts his foot on it will have the cold transferred to him.

The manner of the articles is similar to that of the *Nuzhat*, and the matter is not dissimilar. MUSTAUFÎ however refers directly to the '*Ajâ'ibu-l-Makhlûqât*' principally as his source for the fabulous animals (in the Section « Animals certain of whose Members resemble Man », and elsewhere), or as his authority for curious or mythical statements about more ordinary animals, — not for the general run of his matter, for which indeed he does not as a rule mention any source.

4. — *The Jâmi'u-l-Hikâyât.*

The *Jâmi'u-l-Hikâyât wa Lawâmi'u-r-Riwâyât*, the second great authority quoted by MUSTAUFÎ, is, as RIEU says, a large collection of anecdotes, detached narratives, and miscellaneous notices, either culled from historical works or derived from oral information. It was written by NÛRU-D-DÎN MUHAMMAD 'AUFÎ, author also of the *Lubâbu-l-Albâb*. An outline of his life is given in RIEU's catalogue, and also by BROWNE; he is mentioned as one of the eminent writers who lived in Delhi during the reign of ILTATMISH (A. H. 607-633). The *Jâmi'u-l-Hikâyât* has not yet been edited or translated.

I have examined the MSS. of this work numbered Pers. Add. 16862, Or. 2676, and Or. 236 in the British Museum Library. These are ponderous tomes, the mere transcription of which must have been an immense labour, to say nothing of the original

composition. The work is divided into four parts, each of which is subdivided into 25 chapters. The zoological portion is contained in chapters 21-24 of the fourth part, and in Pers. Add. 16862 takes up twelve and a half folios — 25 pages. The names of the chapters are

The Temperaments of Animals

Wild Beasts

Strange Animals

Curious Birds.

There is thus no attempt at any logical division of the subject; and the several articles are rather collections of stories, with accounts of the useful properties of the animals, than attempts at a systematic zoology. Curiously, the last chapter of all, no. 25 of the fourth part, which follows on the zoological section, is on « The Facetiousness of the Great. »

An idea of the style and contents of the *Ǧāmiʿu-l-Ḥikāyât* may be gained from the following extracts.

Rukh :—They say the rukh is an animal like the camel, and has two humps; and it has front teeth, and in all its limbs and parts is poisonous; and no animal escapes from it. From its blood, spittle, dung, etc., all is deadly poison. Whatever comes into sight becomes its prey, since it is as quick as the wind in running, and can catch up all animals. And if anyone flies from it to the top of a high tree, or onto an embankment where it cannot come, it comes and stands below, and lashes its tail, and urinates, throwing it upwards; and if a drop of it falls on a man, he dies. And for this reason the sages of India have likened the rook at chess to it, since the rook at chess overcomes all other pieces.

I omit one or two sentences in the above passage, which are corrupt in all three MSS. The name of this animal is also the name of the rook at chess in Persian (from which our own name comes).

The *Elephant* is the noblest of animals, and has a friendliness for man, and hence is capable of education and instruction. And his legs cannot be bent, because they are constructed of one bone and have no knee-joint. And he is the longest lived of animals, his age being 100 years, and it may reach 200, or he may live for 300 years. And in the *Ṭabāʾir Ḥaiwânât* one relates that he had heard from trusty friends that an elephant lived for 400 years. His tongue is small and turned the wrong way round, and the tip of his tongue points inwards, con-

trary to the tongue of man. Therefore the sages of India have said that if the tongue of the elephant were straight it would certainly have been able to talk. They said so because the elephant is extremely intelligent, and has strong powers of perception which are receptive of education.

The account is not dissimilar from that in the *Nuzhat*. One of the stories told of the elephant is the following : —

The author states that he heard from Saiyid al-Ḥukamâ Shamsu-d-Dîn Qaisar (*may God lengthen his days !*) that when he was at Naharwâla there was an elephant there belonging to the Raja of Naharwâla; and the keeper used to take him daily to the water, passing in the bâzâr by the shop of a tailor; and the elephant used to put his trunk into the shop and molest the tailor's apprentices; so that the tailor one day thrust his needle into the elephant's trunk to repel him. The elephant withdrew his trunk and went off; and when he had drunk he filled his trunk with water, which he kept there and did not expel. When he arrived at the tailor's shop on his return, he opened his trunk and discharged the water, and ruined all the man's stuffs.

There are considerable verbal differences between the versions of this story in the MSS., and the above translation is not strictly literal. There is or was a Naharwâla in the Gujrât District of the Punjâb; MUḤAMMAD B. ABÎ BAKR 'UMAR B. ABÎ BAKR B. MUḤAMMAD AL-MAKHZŪMÎ AD-DAMÂMÎNÎ AL-MÂLIKÎ, who wrote an abridgement of AD-DAMÎRÎ's work, called 'Ainu-l- Ḥayât (« The Fountain of Life »), finished it there in 823 A.H.

I do not know whether the story of the elephant and the tailor will recall to any readers of this page, as it did to me, the days of childhood; if so, they will perhaps sympathize with my pleasure when, after it had slept in my memory for more years than I feel inclined to specify, I thus happened by chance on its original source, in an ancient Persian MS. in the Oriental Library of the British Museum.

5. — *Other possible Sources.*

A copious list of sources can be collected (v. p. 294 above) from the text of the zoological portion of the *Nuzhat*; but from all of these put together, except the '*Ajâ'ibu-l-Makhlûqât* and the '*Jâmi'u-l-Ḥikâyât*, MUSTAUFÎ can have derived very little of his matter. At the end of the zoological part however, he says, « And

in this section everything that I have not transcribed from other books is taken from the account given in the '*Ajâ'ibu-l-Makhlûqât* and the *Jâmi'u-l-Hikâyât*. »

But from the much smaller number of animals described in these two works (apart from the fact of the differences in the accounts of the same animal) there seems to be a considerable element of the zoological section still unaccounted for. This residue certainly does not depend on the author's own observations, and hence must have been gathered either from other and unacknowledged sources, or from common knowledge and oral tradition. Since MUSTAUFÎ seems to have been on the whole rather proud than otherwise of his list of authorities (after the manner of some more modern writers), we are perhaps justified in assuming that a fair proportion of his matter has the latter origin.

Some of this traditional matter is no doubt ancient, and to be found in Greek and Roman authors. Thus the statement in the *Nuzhat*, that if the tongue of a frog be laid on the heart of a sleeping woman she will tell whatever she may have done, is found in PLINY, quoted from DEMOCRITUS.

« DEMOCRITUS says, that if one tears out the tongue from a living frog in such a way that no other part remains attached to it, and places the frog again in the water, and lays the tongue on the heart of a sleeping woman, she will answer truly to any question. »

It is however not part of my present plan to follow out the animal lore which has descended through the ages in this way; those who undertake the work will find much material for comparison ready to their hand in the compilations of H. O. LENZ, *Zoologie der alten Griechen und Römer*, Gotha, 1856 (annotated extracts from classical and post-classical authors), from which I have quoted the above passage from PLINY, and of L. LEWYSOHN, *Die Zoologie des Talmuds*, Frankfort am Main, 1858.

6. — *Comparison with the* PHYSIOLOGUS.

I will however permit myself briefly to note a few passages from the « *Physiologus* », the zoological textbook of Christianity in mediæval times, a compilation which exists in many forms and perhaps originated in Alexandria in the second or third century A.D., which was quoted from the earliest fathers of

the church onwards, and was in use, for edification or instruction, to the close of the middle ages. I have used the recent translation of CARLILL in *The Epic of the Beast*, Routledge, London, n.d. (? 1926) (Broadway Translations).

In the *Nuzhat*, the leopard sleeps three days after feeding; in the *Physiologus*, the panther awakes on the third day after feeding.

In the *Nuzhat*, the hyaena is hermaphrodite, and every year the organs of one sex are excited; in the *Physiologus*, it is man-woman, now male now female.

In the *Physiologus* we once more meet with the statement that the elephant's legs have no joints,—«when he falls down, he is unable to rise again, for his legs have no joints.» As to the «little elephant», it is said, «if you burn his hair or his bones in any place whatever, that place is for ever free from devils or snakes, nor will ever any evil thing be found there.» In the *Nuzhat* the smoke of the elephant's bones will keep off worms and other pests from the land, and will drive mosquitos out of a house.

In both, the dolphin rescues drowning mariners; but this is given from an Arabic version of the *Physiologus*, and seems not to exist in Western collections.

In both, neither the male nor the female crow takes another mate when one has died.

In the *Nuzhat*, the ostrich eats fire; in the *Physiologus* it «swallows even glowing iron and nails and fiery coals». In the *Physiologus*, the ostrich is the bird that can carry off an elephant; but in the *Nuzhat* this is the '*anqâ* or *simurgh*.

In both, the phoenix dwells in India; and in both is regenerated from a worm in the ashes after it has burnt itself, though the accessory details are different in the two accounts.

The halcyon, in the *Physiologus*, broods on her eggs seven days, during which time the sea is calm (LIDDELL and SCOTT, and BREWER's «Dictionary of Phrase and Fable», give fourteen days as the period of calm). There is a reminiscence of this in the description of the *fanûn* (the reading of this name is doubtful) in the *Nuzhat*, a bird which lays its eggs on the face of the water in the Indian Sea, and hatches them in fourteen days, and during those days the sea never becomes rough.

While in the *Nuzhat* the salamander «usually lives in the fire», in the *Physiologus* it actually puts out the fire.

In both, the ant, when storing up food, bites the grain in two pieces, so that it may not sprout.

There can hardly be any question of direct borrowing on either

side; the similarities are due to the descent of tradition from a common source.

7. — *An English Comparison.*

In the middle of the 13th century an English Franciscan, BARTHOLOMEW DE GLANVILLA, wrote a compendium of knowledge very like the *Nuzhat* in scope. GLANVILLA begins with Theology, and treats of the Trinity, the Angels, etc.; he proceeds to consider Man, — his Psychology, Physiology, Anatomy, Sociology; then come Medicine; Astronomy, the Calendar; the Elements, and Meteorology; Birds, Geography, Mineralogy, Botany, Beasts and Insects. The work was very popular; there were ten editions in the 15th century, and the last editions were published in 1535 and 1582.

There is however no great degree of similarity between the contents of the zoological sections in GLANVILLA and in the *Nuzhat*. A few resemblances there are; there is the worm in the ashes of the phoenix, which grows into another phoenix. In GLANVILLA also, as in the *Physiologus*, the salamander does not only manage to live in the fire, but puts it out. In GLANVILLA the elephant never lies down to sleep, but leans against a tree (this is stated in the *Physiologus* also); the reason is not given by GLANVILLA, but knowing the tradition we can guess a connection with the absence of joints in his legs. Presumably these statements were taken by GLANVILLA directly from the *Physiologus*.

The general level of knowledge is much the same in GLANVILLA as in the *Nuzhat*. GLANVILLA also has his mythical creations, — Mermaids, Fauns, and Satyrs, as well as monsters which partake of the nature of more than one of the better known beasts, — for example, the Omocentaur, the offspring of the bull and the ass.

8. — *Arabic and Persian Zoology after the Nuzhat.*

One great name follows that of MUSTAUFÎ in the list of zoological authors of Islamic countries, — that of AD-DAMÎRÎ, a large part of whose work, the *Ḥayâtu-l-Ḥayâwân*, was translated from the Arabic by JAYAKAR (London and Bombay, 1906, now out of print); the translation however was never completed. JAYAKAR's Introduction gives an account of the author's life, of the characteris-

tics of the book, and of its place in Arabic literature; a shorter sketch of the author and his work is that by CARRA DE VAUX in the second volume of his *Les Penseurs de l'Islam*.

KAMÂLU-D-DÎN MUḤAMMAD B. MÛSÂ AD-DAMÎRÎ, a jurisconsult by profession, was born at Cairo in A. H. 745 (A.D. 1344), and died there in 805 (1405). The *Hayâtu-l-Hâyâwân* was finished, according to BROCKELMANN, in 773 (1371), 33 years after the *Nuzhatu-l-Qulûb*. It is a large work, comprising 1383 pages in the Cairo lithographed edition of A.H. 1330 (A.D. 1912). It is however no exaggeration to say that the amount of zoological information contained in it is scarcely more in volume than that in the zoological section of the *Nuzhat*; the work is really philological and literary in its objects, and is composed mainly of anecdotes, grammatical disquisitions, citations of proverbs, traditions, legal decisions, the interpretation of dreams of animals, and excursus of various kinds; for example, the author goes so far as to introduce in the middle of the section on the Goose, a history of the Caliphate extending to more than 100 Arabic pages (equal to 130 pages of the translation). Since the Cairo edition of the text is easily procurable, and the extant translation of Jayakar comprises three-quarters of the work, I need not say more about it here.

The only other Arabic zoological work after the date of the *Nuzhat* given by BROCKELMANN is MUḤAMMAD B. 'ABDALKARÎM AŞ-ŞAFADÎ's *Al Multaqat min 'Ajâ'ib al Makhhlûqât wa Hayât al Hayâwân*, i.e. A gathering or gleanings from QAZWÎNÎ's *'Ajâ'ibu-l-Makhhlûqât* (described above) and DAMÎRÎ's work; this was compiled in A. H. 896 (A.D. 1490), and exists in manuscript at Constantinople.

I know of no work in Persian on Zoology subsequent to the *Nuzhat*.

9. — *The Importance of the Zoological Section of the Nuzhat.*

The Zoological Section of the *Nuzhatu-l-Qulûb* constitutes therefore, slight and immature though it is, one of the very few extant zoological treatises of the Islamic East, — and is apparently the only one whose primary object can be with any degree of truth described as scientific; the rest are essentially literary or philological, or have other ends in view than the scientific.

V. THE NUZHATU-L-QULÛB IN RELATION TO MEDICINE.

Under the heading « Properties » (Khawâss), or often without any special heading, there is given after the description of each animal a list of the medical (and magical) uses of its several parts. We thus have a « Materia Medica », — a list of the drugs of animal origin used in Persia at the time of the compilation of the *Nuzhat*; the botanical and mineralogical sections similarly include the uses of the vegetable and mineral drugs. Besides a list of drugs we thus obtain the names of the diseases in which they were employed; and both lists contain much that is interesting.

1. — *The Diseases mentioned in the Zoological Section.*

I give below a fairly complete list of the diseases for which the animal remedies were prescribed, with their modern equivalents. It is not always a simple matter to determine the modern term which should be used to render the Persian or Arabic; dictionary translations can of course be found, but are not in all cases satisfactory. Sometimes the Persian or Arabic term includes more than one condition now recognized as distinct; sometimes there is a real doubt as to what is meant.

In deciding the exact meaning of a number of the names of diseases I must acknowledge the help I have had from a work which was brought to my notice by the late Prof. BROWNE. In 1874 JOH. L. SCHLIMMER, Senior Professor of Medicine at the Polytechnic College of Persia, Principal Medical Officer and titular Colonel of the Persian Army, and Sanitary Officer of Teheran, published at Teheran a *Terminologie Medico-Pharmaceutique et Anthropologique Française-Persane*. This, though containing a number of sometimes lengthy disquisitions and extracts from his lectures, is essentially a glossary of French medical (including anatomical and pharmaceutical) terms, with their English and German equivalents, rendered into Persian. The work, which is a lithograph, comprises 600 folio pages; its usefulness is much enhanced by an index, which gives an alphabetical list of the *Persian* terms with the pages on which they are to be found. But it is of course not certain that Persian medical terms are used today in the sense which they bore in the 14th century.

I give first a few notes on the names of certain diseases which

might cause difficulty, or have, as I think, sometimes been misapprehended in the past.

(1) Several words are translated by «leprosy» in the dictionaries; (a) *baraş* — leprosy of the anaesthetic or maculo-anaesthetic kind. The infiltration takes place principally into the nerves; the nerve fibres are first irritated, then destroyed; sooner or later a macular eruption appears as flat red spots, which grow larger, the centres becoming pale; the skin in the affected area is anaesthetic, wrinkled and scaly; and along with the loss of the sense of pain trophic changes occur, leading for example to the falling off of fingers and toes, or portions of them.

(b) *judhâm* — leprosy, as I take it, of the tubercular kind, characterized by nodules, which occur most often on the limbs and face, and as they increase in size totally alter the patient's appearance. «Elephantiasis» is given as an alternative translation in both LANE and STEINGASS, and is even used as a rendering by BROWNE in his *Arabian Medicine*; but this is a relic of the confusion introduced by GALEN (compare what is said under *dâ'u-l-fîl*).

(c) *bahaq* — according to LANE, the mild species of leprosy termed «alphus» or «vitiligo alba», or, alternatively, the species of leprosy termed «melas» or «lepra maculosa nigra». SCHLIMMER uses *bahaq* as the translation of «melas», a disease which he had not seen personally, but which is described as characterized by spots; it is of two kinds, black and white. In the black variety, the skin becomes black, showing red under the pressure of the finger, and feels rough; but the hairs do not change their natural colour. In the white, the colour tends towards white, or rather differs little from the normal; the skin is rough to the touch, while the hairs remain black or become date-coloured. A distinction from *baraş* is that in the latter the hairs become white.

The description corresponds to *sclerodermia*. In the diffuse form of this condition, the skin changes are diffuse and symmetrical; there is stiffness, induration and immobility, — a «hide-bound» condition; some change of colour takes place, to a waxy, parchment-like appearance, while there is often increased pigmentation in the neighbouring skin. In the circumscribed form known as *morphoea* (which term I have chosen in my translation) there are yellowish-white waxy or ivory-like spots, and there is a stiffening of the skin. According to CASTELLANI and CHALMERS

diffuse sclerodermia is rare [in the tropics] but morphoea is rather frequent.

(II) *bayâdu-l-‘ain*, I take to be *corneal opacity* (lit. « whiteness of the eye »; not in SCHLIMMER or LANE).

(III) *taqîr*, a dribbling or dropping, sc. of the urine; according to LANE, from cold; i. e., incontinence, but neither strangury nor diabetes, as Steingass gives.

(IV) *khunâq* : SCHLIMMER gives this as the Persian translation of « angine couenneuse », « angine maligne », « angine diphtherique », « croup », — i.e., diphtheria. The dictionaries also give « quinsy »; the literal meaning is « suffocation, strangulation » which would include the choking or suffocation from both the diphtheritic membrane and tonsillar abscess, and I have little doubt that both were included under the term, quinsy being perhaps oftener met with than diphtheria.

(V) *dâ‘u-th-tha‘lab*, « fox disease »; the disease of the scalp known as « scald-head », common in the East, giving rise to a patchy baldness. It is a ringworm of the scalp, the *tinea capitis tropicalis* of CASTELLANI and CHALMERS; while this is common, alopecia areata, according to the above writers, « is apparently rare among natives ».

(VI) *dâ‘u-l-fîl*, « elephant disease, » elephantiasis; a filariasis due to *Filaria bancrofti*, introduced by the bite of a mosquito; the adult worms lie in the lymphatic vessels and may obstruct the flow of lymph, giving rise to a block in the vessels, and consequent swelling. The huge swelling of the legs is well known, and has given the name to the condition. The word « elephantiasis » was first used by CELSUS to denote what we know as leprosy; GALEN included the above condition of filariasis under the same term, and with the passage of time the error became established. The Arab physicians of the ninth and tenth centuries however described the filariasis as « dâ‘u-l-fîl » apart from leprosy.

(VII) *diqq*; LANE gives only « hectic fever », SCHLIMMER « marasme, Eng. atrophy »; presumably any wasting disease with long continued fever, phthisis among them.

(VIII) *şar‘*, epilepsy; according to SCHLIMMER epilepsy is relatively very common among the negress slaves in Persia, and very rare among Persian women.

(IX) *ghashâwa*, « a veil », seems to be something different from corneal opacity (*bayâdu-l-'ain*), — perhaps a diffuse corneal opacity, while *bayâd* is a leucoma? The word is not in SCHLIMMER. But *ghishâ'* (« a cover or covering », LANE) according to SCHLIMMER in modern Persian is « night-blindness, hemeralopia ».

(X) *kalaf*, « freckles » according to the dictionaries; « a dingy redness that comes upon the face » (LANE); the word is not in SCHLIMMER. This condition is mentioned not very infrequently; what we know ordinarily as « freckles », however, would scarcely be of such importance; nor, perhaps, would it be easily seen in a dark-complexioned race. I think *Chloasma* is meant. « Chloasma is a very common affection in the tropics.... the dark brownish or dirty yellowish patches of chloasma are plainly distinguishable in the skin of Indian and Sinhalese natives, though in African negroes they may be indistinguishable » (CASTELLANI and CHALMERS). The discoloration commonly affects the face. In chloasma solare, in addition to hyperpigmented spots, depigmented patches are also developed. There are other forms of the affection, including chloasma malaricum in chronic malaria.

(XI) *laghwa*, facial paralysis; the mention of this affection occurs fairly often, and the condition may therefore have been common, either as part of a hemiplegia (along with which it is often mentioned) or as BELL's palsy, affecting the facial nerve only, and produced, for example, by exposure to cold as in sleeping outside.

(XII) *nuzûl mâ'i-l-'ain*; in modern Persian, according to SCHLIMMER, *nuzûl-i-âb-i-marwârîd* is used for cataract, *nuzûl-i-âb-i-sabz* for glaucoma. Formerly *nuzûl mâ'i-l-'ain*, or *nuzûl-i-âb-i-chasm* probably included both; when I was in India many patients used to come with chronic glaucoma, thinking it was cataract and could be cured by the usual operation for the latter.

The total number of diseases is less than 100; a few more general terms are also found, such as « pain in the spleen », « pain in the kidney », etc.

âb basta,
iḥshâsh,
ikhtinâq-i-raḥm,
irtî'âsh,
istirkhâ,

retention of urine.
dead foetus in the womb (?)
hysterics (SCHL.)
trembling, tremors.
flaccidity (paralysis).

istisqâ,	dropsy
ishâl,	diarrhoea
aṭrûsh,	deafness
imtilâ,	surfeited stomach
andûh,	anxiety (grief, sorrow, SCHL.)
bâdha-i-zisht, bâdha-i-ghalîz,	troublesome wind
baraş,	maculo-anaesthetic leprosy
bawâsîr	piles
baulu-l-farâsh,	bed-wetting
baul basta,	retention of urine
bahaq,	morphoea
bayaḍu-l-‘ain,	corneal opacity (? leucoma)
bîkhwâbî,	sleeplessness
târîkî-i-chashm,	dimness of vision
tab-i-rib‘,	quartan fever
tashannuj,	painful cramp (SCHL.); also convulsions (SCHL.)
taqtîr-i-baul,	dribbling of urine (incontinence)
thûlûl, pl. thaâlîl,	a wart (SCHL.)
judhâm,	tubercular leprosy
jarab,	scabies (SCHL.)
junûn,	insanity; frenzy, mania (SCHL.)
ḥummâ,	fever
ḥabbu-l-qar‘,	tapeworm (SCHL.)
khadar,	torpid (of limbs) ?
khafaqân,	palpitation (SCHL.)
khanâzîr,	tuberculous glands
khunâq,	diphtheria; also quinsy.
dâ‘u-th-tha‘lab,	ringworm of the scalp
dâ‘u-l-fîl,	elephantiasis
dard-i-dandân,	toothache
dard-i-shush,	pleurisy (SCHL.)
diqq,	marasmus; atrophy (SCHL.)
dummal,	boil; abscess (SCHL.)
dandân-i-kirm-khûrda,	carious teeth (lit. worm-eaten teeth).
ru‘âf,	epistaxis (SCHL.)
ra‘sha,	tremors (SCHL.)
ramad,	ophthalmia

rîsh,	a wound
zabân-i-basta,	dumb
sabal,	pannus (SCHL.), a web in the eye.
sapîdî-i-chashm,	opacity of the cornea
sarsâm,	frenzy; delirium (SCHL.)
saratân,	cancer
surfa,	cough
sarmâ-yâfta,	frost-bitten (?)
su'âl,	cough (SCHL.)
sill,	consumption, atrophy (SCHL.)
salasu-l-baul,	diabetes
sang-i-mathâna,	stone in the bladder
sûkhata,	a burn
saudâ'î,	melancholy (but sawdâ', a rash, SCHL.)
shab-kûrî,	night blindness
shuqâq, pl. shaqâ'îq,	fissure (shuqâq-i-maq'ada, fissure of the anus, SCHL.)
şudâ',	headache
şar',	epilepsy
ţuhâl,	disease of the spleen
ţurûsh,	deafness
ţalq,	pains of childbirth
ţufra,	pterygium (SCHL.)
'irqu-n-nisâ,	sciatica
'usru-l-baul,	strangury (SCHL.)
'usru-l-wilâdat,	difficult labour
ghishâ,	night-blindness (SCHL.)
ghashâwa,	diffuse corneal opacity (?)
ghashayân,	fainting fit (ghashy SCHL.)
falj, fâlij,	hemiplegia, palsy (SCHL.)
qarḥ,	ulcer
qurûḥa-i-shush,	ulcers of the lungs
qûbâ,	rash, exanthema (SCHL.)
qûlinj,	colic
kalaf,	chloasma
gûsht-i-afzûnî,	proud flesh (gûsht-i-zâ'îda, SCHL.)
laghwa,	facial palsy

mafâşil,	rheumatism (used for waj'-i-ma-fâşil)
(bar âmadan-i-)mûy bar chashm,	trichiasis
nâsûr,	fistula (SCHL.)
nuzûl-i-âb-i-chashm,	
nuzûl-i-mâ'ul-l-'ain,	cataract (plus glaucoma probably)
niqris,	gout
waj'u-l-mafâşil,	rheumatism
waram,	swelling; inflammation (SCHL.)
yaraqân,	jaundice.

2. — *Common Diseases which find no mention.*

Certain well known diseases of the East do not appear in the above list. As examples may be mentioned cholera, dysentery, plague, malaria (except in the form of quartan ague), and trachoma.

Cholera, *wabâ* in modern Persian according to SCHLIMMER, not *haiḍa* (pron. *haiza*) as in India; this latter term is used for a diarrhoea from surfeit, and for the cholera of weaned children (SCHLIMMER). The word *wabâ* occurs once in the present section of the *Nuzhat*, but it appears to have, as originally and properly, a general sense, — pestilence or epidemic disease (« a great number of frogs above the usual in a country is a cause of the outbreak of pestilence »). Perhaps cholera is included under *ishâl*, diarrhoea, or under *qûlinj*, colic.

Dysentery, in mod. Persian, according to SCHLIMMER, *ishâl-i-khûnî* or *ishâl-i-damarwî* may similarly have been included under diarrhoea or colic.

Plague, *tâ'ûn*, possibly had not come under the author's notice.

Trachoma, granular lids, was probably best known by its consequences, — irritation of the conjunctiva and, later, infiltration and a white opacity of the cornea (*bayâḍu-l-'ain*).

The most surprising omission is perhaps that of any variety of *malaria* except quartan ague, *tab-i-rib'*. Intermittent fever in general is in modern Persian, *nauba*, *ḥumma-i-dâ'ira*, *tab-i-larż* (SCHLIMMER).

It must not be forgotten that there are botanical and mineralogical sections of the *Nuzhat*, as well as the present zoological part, and that possibly diseases may find mention in them which are not referred to in the present part. Yet this as hardly probable,

at least in the case of diseases of any frequency; most (nearly all, I think) of the diseases in my list are mentioned more than once in the zoological part, and many occur again and again; so that the chance of a common disease finding mention in the 52½ pages (of the Bombay lithograph) which treat of mineralogy and botany, and escaping reference in the 38 pp. on zoology, is small.

3. — *The Diseases most frequently mentioned.*

On reading the text of the *Nuzhat* it will soon be noticed that, as just said, certain diseases are mentioned with considerable frequency; and we must ask if we can base on this fact any conclusions as to the frequency of occurrence of the diseases themselves. At first sight it would seem as if we cannot; the number of times that a disease is mentioned in a *Materia Medica* such as this corresponds to the number of drugs that have been employed in treating it. The more reliable any drug is found to be, the fewer rivals it will have; the commonest disease in the world, malaria, would nowadays find mention under a very small number of remedies. Frequency of mention means therefore inadequacy of any single remedy rather than frequency of occurrence.

On the other hand we of today, looking through the list of animals and of their several organs that have been used as remedies, may find it hard to believe that *any* of them can have been adequate to cure the complaints for which they were prescribed; and it is impossible to suppose that a single mention of a given disease means that the corresponding remedy was of such efficacy that there was no need to search for other cures.

Since thus the efficacy, or rather the inefficacy, of the remedies cannot be what determines the frequency with which the various diseases receive mention, it is probable that the frequency of their occurrence has more to do with it than anything else. A larger number of remedies would naturally be tried in the commoner diseases, and no doubt *some* recoveries or remissions would follow in the case of any remedy that was not actively harmful; while it is unlikely that there would be a large armamentarium for the treatment of a really rare disease; and in a popular compendium like the present it would not be worth while mentioning a large number of drugs for only a very occasional use.

Bearing in mind, then, the possibility of mistakes in arguing from frequency of mention to frequency of occurrence, the following appear to have been among the commonest diseases in 14th century Persia : — (I) *Cataract*; (II) *Corneal Opacities*; (III) *Stone in the Bladder*; (IV) *Ringworm of the Scalp*; (V) *Leprosy* (maculo-anaesthetic and tubercular); (VI) *Tuberculous Glands*. As regards these, no comment is required; the picture given by the *Nuzhat* is doubtless much the same as what we find today; at least, speaking from personal experience, it is much the same (except perhaps as regards leprosy) as is seen in a neighbouring region, the Punjab.

(VII) *Hemiplegia* is mentioned rather frequently, and facial palsy often in conjunction with it. My own experience in the Punjab is that apoplexy with its consequences is not common. On general grounds also it is a little surprising to find *fâlij* occurring so often; one thinks of hemiplegia as associated with the high blood-pressure and arterial degenerations of our latter-day civilization rather than with the simpler conditions of an earlier time.

(VIII) *Quartan Fever*, — the only variety of fever of which the periodicity is mentioned. I have commented on this above. « Fever », without the qualifying adjective, is rare.

(IX) Not very uncommon is the mention of *Khunâq*, at present (SCHLIMMER) used for *diphtheria* or croup; but, as explained above, *quinsy* or tonsillar abscess is probably to be included. The word *Khunâq* means literally « a throttling, strangling, choking ».

(X) *Morphoea*, and (XI) *Chloasma* have already been commented on above.

4. — *Certain Special Classes of Remedies.*

It is interesting to notice that much attention was paid to the hair, and not to the hair of the head only. Depilatories, — remedies for getting rid of superfluous hair, — are frequently mentioned; for example, the bile of a porcupine, the blood of a bear mixed with chiretta, burnt frog; or again « if a leech be placed in a glass till it dies, then dried and rubbed up, and applied to a place where hair grows, no more hair will grow there ». Quite as numerous are the applications for causing a growth of hair; e.g., the ashes of earthworms applied to the head with oil of roses, or « five

drachms of a mule's hoof mixed with oil of roses, if rubbed on any place, will cause hair to grow there, and will cure scald head » (i.e. *tinea capitis*).

But the class of drugs that is mentioned oftener than any other is the aphrodisiac. The number of substances which had the reputation of increasing sexual power, some when taken internally, others when applied locally to the male organ, was very great, and presumably indicates a considerable resort to this class of drugs.

5. — *On the Animal Remedies of the Nuzhat in General.*

(a) *The Parts Used.* Of the parts of animals used as medicaments perhaps the one most commonly mentioned is the *bile*. The *brain* was also frequently used, and so too the *blood*. The *fat* was more often employed, perhaps, than the *flesh*. Other organs such as the *spleen* and the *heart* are occasionally mentioned. The ashes of the *bones* were in use; sometimes a particular bone is specified, most frequently the *astragalus*. The *skin* is often referred, to, almost always for sleeping on. Indeed nearly every part seems to have been used in some animal or other. Whole animals are used, if small, or sometimes their ashes; e.g., earth-worms « baked and eaten with bread, reduce the size of a stone in the bladder and bring about its expulsion. When dried and eaten they cure the yellowness of jaundice. Their ashes applied to the head with oil of roses make the hair to grow. »

(b) *The Principles of Treatment.* I may briefly remind my readers that there were in all nine types of Complexion, or Temperament, — the four simple complexions, hot, cold, dry and moist; four compound, hot and dry, hot and moist, cold and dry, and cold and moist; and the equable, in which no quality preponderated. To quote from BROWNE's *Arabian Medicine*. « Excluding the rare case of a perfect equilibrium, every individual will be either of the Bilious Complexion, which is hot and dry; the Atrabilious or Melancholic, which is cold and dry; the Phlegmatic, which is cold and moist; or the Sanguine, which is hot and moist. In treating a hot, cold, dry or moist disease with a food or drug of the opposite quality, regard must be paid to these idiosyncrasies. The Natural Property inherent in each food or drug exists in one of four degrees. Thus, for example, such a

substance if hot in the first degree is a food; if hot in the second degree, both a food and a medicine; if hot in the third degree, a medicine, not a food; if hot in the fourth degree, a poison. »

(c) I may briefly refer to the fact that *Polypharmacy* was apparently not in fashion. The remedies mentioned in the *Nuzhat* are mostly quite simple, one thing alone, or sometimes mixed with oil or some other vehicle. We never get such a prescription as, for example, one in use in the 18th century in England, for fevers in children, measles, and smallpox, compounded of burnt hartshorn, white amber, red coral, crabs' eyes and claws, saffron and cochineal; yet this is a comparatively mild example of polypharmacy.

(d) Finally, it may be added that there are a few instances where the *homoeopathic principle* (*similia similibus curantur*) can be detected. For example, if the spleen of a porcupine be roasted and eaten by one with disease of the spleen, he will be cured; if a tick be put in the mouth of a child that has not yet taken any food, and that child, arrived at manhood, takes water into his mouth and scatters it over sheep infested with ticks, all the ticks will fall off and die.

VI. MAGICAL USES OF ANIMALS AND THEIR PARTS.

Besides the therapeutic uses of the several organs of the various animals, other applications are also frequently given. These are sometimes of general household utility, such as driving away insects or reptiles, often said to be a property of the smoke of the dung or of certain organs; sometimes they can only be described as magical.

The line between magical and therapeutic uses is hard to draw; and it is often difficult to say in which category a given use should be placed. Thus it is stated that if a peacock's claw be tied on a woman in the pains of childbirth it will relieve them immediately; one is inclined to call this magic, but if the instruction had been to calcine the claw and give a little of the powder internally — presumably a no more rational or efficacious proceeding — we should consider it therapeutics.

I have collected 32 instances of what we should call definitely magic; but it would be tedious to give them all. I content myself with a few examples, taken quite at random : —

(i) Carrying about the ankle-bone (astragalus) of the hare averts the evil eye.

(ii) The crop grown from seed that has been sifted through a sieve made of an ape's skin is safe against pests.

(iii) If two enemies eat together of the fish *alyan* their enmity will be converted to friendship.

(iv) When the blood of an owl is burnt among carousers the smoke from it will cause a brawl.

(v) If the blood and bones of the bird called the *ghawwâs* are burnt along with human hair, the owner of the hair will be impatient to visit the one who burns it.

(vi) If frog's blood be rubbed on a person's face, every one that sees him will be fond of him.

(vii) Any place in which the eye of a black dog is buried will fall into ruins.

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